AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (canceled).

2. (currently amended): The optical signal regenerative repeater according to claim 4,

wherein said pulse time width of said first controlled light is smaller than said pulse time width of said first control light.

3. (currently amended): The optical signal regenerative repeater according to ~~claim 4~~,claim 5,

wherein said pulse time width of said second control light is smaller than said pulse time width of said second controlled light.

4. (currently amended): An optical signal regenerative repeater comprising:

~~at least one~~ a first optical 3R repeater which receives an optical communication signal pulse, and regenerates said optical communication signal pulse,

wherein said first optical 3R repeater comprises:

a first clock extraction unit which extracts a first clock from said optical communication signal pulse and which generates a first optical clock pulse synchronized with said extracted first clock, and

a first optical gate, which is opened and closed in accordance with a first control light corresponding to said optical communication signal pulse, which receives as a first controlled light said first optical clock pulse generated by said first clock extraction unit, and which generates a first regenerated signal pulse corresponding to said optical communication signal pulse,

wherein a pulse time width of said first control light ~~and~~ is different from a pulse time width of said first controlled light ~~is different~~, and

wherein said optical signal regenerative repeater further comprises:

a second optical 3R repeater which receives said first regenerated signal pulse output by said first optical 3R repeater as an intermediate signal light, and regenerates said optical communication signal pulse based on said intermediate signal light;

wherein a pulse time width of said intermediate signal light is smaller than a pulse time width of said optical communication signal pulse.

5. (currently amended): The optical signal regenerative repeater according to claim 4,

wherein said second optical 3R repeater comprises:

a second clock extraction unit, which extracts a second clock from said intermediate signal light and generates a second optical clock pulse synchronized with said extracted second clock and having an arbitrary pulse time width for optical communication; and

a second optical gate, which is opened and closed in accordance with a second control light corresponding to said intermediate signal light, which receives as a second controlled light said second optical clock pulse generated by said second clock extraction unit, and which

generates a second regenerated signal pulse corresponding to said optical communication signal pulse.

6. (previously presented): The optical signal regenerative repeater according to claim 5,

wherein said arbitrary pulse time width for optical communication of said second optical clock pulse and a pulse time width of said optical communication signal pulse input to said first optical 3R repeater are substantially the same.

7. (previously presented): An optical signal regenerative repeater according to claim 5,

further comprising a pulse width converter which converts said pulse time width of said second regenerated signal pulse into said arbitrary pulse time width for optical communication,

wherein said arbitrary pulse time width for optical communication of said second optical clock pulse and said pulse time width of said intermediate signal light are substantially the same.

8. (original): The optical signal regenerative repeater according to claim 7,

wherein said pulse time width of said second regenerated signal pulse converted by said pulse width converter and said pulse time width of said optical communication signal pulse are substantially the same.

9. (currently amended): The optical signal regenerative repeater according to claim 4, wherein said second optical 3R repeater comprises:

a second clock extraction unit, which extracts a second clock from said first optical clock pulse generated by said first clock extraction unit, and which generates a second optical clock pulse synchronized with said extracted second clock; and

a second optical gate, which is opened and closed in accordance with a second control light corresponding to said intermediate signal light, which receives as a second controlled light said second optical clock pulse generated by said second clock extraction unit, and which generates a second regenerated signal pulse corresponding to said optical communication signal pulse.

10. (original): The optical signal regenerative repeater according to claim 9,

wherein said pulse time width of said second controlled light supplied to said second optical gate is substantially the same ~~to~~ as said pulse time width of said optical communication signal pulse.

11. (currently amended): The optical signal regenerative repeater according to claim 4, wherein said second optical 3R repeater comprises:

a pulse width converter which converts said first optical clock pulse generated by said first clock extraction unit into an arbitrary pulse time width for optical communication; and

a second optical gate, which is opened and closed in accordance with a second control light corresponding to said intermediate signal light, which receives as a second controlled light said first optical clock pulse converted by said pulse width converter, and which generates a second regenerated signal pulse corresponding to said optical communication signal pulse according to said second controlled light received by said second optical gate.

12. (currently amended): The optical signal regenerative repeater according to claim 11,

wherein said pulse time width of said second controlled light received by said second optical gate is substantially the same ~~to~~ as said pulse time width of said optical communication signal pulse.

13. (original): The optical signal regenerative repeater according to claim 11, further comprising:

a wavelength converter which converts into an arbitrary wavelength a wavelength of said first optical clock pulse generated by said first clock extraction unit.

14. (canceled).

15. (currently amended): The optical signal regenerative repeater according to claim 4, wherein said second optical 3R repeater comprises:

a second optical gate, which is opened and closed in accordance with a second control light corresponding to said intermediate signal light, which receives as a second controlled light said first optical clock pulse generated by said first clock extraction unit, and which generates a second regenerated signal pulse corresponding to said optical communication signal pulse according to said second controlled light received by said second optical gate; and

a pulse width converter, which converts into an arbitrary pulse time width for optical communication a pulse time width of said second regenerated signal pulse generated by said second optical gate.

16. (original): The optical signal regenerative repeater according to claim 15, further comprising:

a wavelength converter, which converts into an arbitrary wavelength a wavelength of said first optical clock pulse generated by said first clock extraction unit.

17-24. (canceled).

25. (previously presented): An optical signal regeneration method comprising:

receiving an optical communication signal pulse;

extracting a clock from said optical communication signal pulse and generating a first optical clock pulse synchronized with said extracted clock;

supplying said optical communication signal pulse as a control light to a first optical gate to open or close said first optical gate;

supplying said first optical clock pulse as a controlled light to said first optical gate; and

employing said controlled light to obtain a first regenerated signal pulse corresponding to said optical communication signal pulse according to opening or closing of said first optical gate,

wherein a pulse time width of said control light and said controlled light is different, and

wherein the optical signal regeneration method further comprises:

extracting a clock from said first regenerated signal pulse and generating a second optical clock pulse synchronized with said extracted clock from said first regenerated signal and having an arbitrary pulse time width for optical communication;

supplying said first regenerated signal as a control light to a second optical gate to open or close said second optical gate; and

supplying said second optical clock pulse generated as a controlled light to said second optical gate; and

employing said controlled light supplied to said second optical gate to obtain a second regenerated signal pulse corresponding to said optical communication signal pulse according to opening or closing said second optical gate based on said first generated optical signal pulse.

26. (previously presented): The optical signal regeneration method according to claim 25, further comprising:

converting into an arbitrary pulse time width for optical communication a pulse time width of said second regenerated signal pulse.

27. (previously presented): The optical signal regeneration method according to claim 25, further comprising:

extracting a clock from said first clock optical signal pulse and generating a second optical clock pulse synchronized with said extracted clock and having an arbitrary pulse time width for optical communication;

supplying said first regenerated signal pulse as a control light to a second optical gate for opening or closing said second optical gate;

supplying said second optical clock pulse as a controlled light to said second optical gate; and

employing said controlled signal supplied to said second optical gate to obtain a second regenerated signal pulse corresponding to said optical communication signal pulse according to opening or closing of said second optical gate based on said first regenerated signal pulse.

28. (previously presented): The optical signal regeneration method according to claim 25, further comprising:

converting, into an arbitrary pulse time width for optical communication, a pulse time width of said first optical clock

pulse;

supplying said first regenerated signal pulse as a control light to a second optical gate for opening or closing said second optical gate;

supplying said first optical clock pulse, for which said pulse time width is changed, as a controlled light to said second optical gate; and

employing said controlled light supplied to said second optical gate to obtain a second regenerated signal pulse corresponding to said optical communication signal pulse received according to opening or closing of said second optical gate based on said first regenerated signal pulse.

29. (previously presented): The optical signal regeneration method according to claim 25, further comprising:

supplying said first regenerated signal pulse as a control light to a second optical gate to open or close said second optical gate;

supplying said first optical clock pulse as a controlled light to said second optical gate;

employing said controlled light supplied to said second optical gate to obtain a second regenerated signal pulse corresponding to said optical communication signal pulse according to opening or closing of said second optical gate based on said first regenerated signal pulse; and

converting into an arbitrary pulse time width for optical communication a pulse time width of said second regenerated signal pulse.

30. (original): The optical signal regeneration method according to claim 28, further comprising:

converting into an arbitrary wavelength a wavelength of said first optical clock pulse.

31. (original): The optical signal regeneration method according to claim 29, further comprising:

converting into an arbitrary wavelength a wavelength of said first optical clock pulse.

32-35. (canceled).

36. (new): The optical signal regenerative repeater according to claim 5, wherein a pulse time width of said second control light is different from a pulse time width of said second controlled light.